

ABSTRACT

A method and apparatus are provided for humidifying oxidant supplied to a fuel cell system, which can be a single fuel cell or a multiplicity of fuel cells. A catalytic reactor is provided, which is supplied with a portion of the fuel and the oxidant. The oxidant is supplied in excess of the fuel to the reactor, so as to generate a stream of oxidant which is both heated and humidified. For an air breathing stack, this heated oxidant can simply be mixed with air flowing through the fuel cell stack. For a closed system, a heated and humidified oxidant flow, and optionally a fuel flow are mixed with additional flows of these gases supplied to the fuel cell.